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ABSTRACT

This document consists of three papers presented at a symposium on transfer of training moderated by Gene Roth at the 1996 conference of the Academy of Human Resource Development (AHRD). "Validation of a Transfer Climate Instrument" (Reid A. Bates et al.) reports a study that attempted to validate Rouiller and Goldstein's (1993) eight-factor structure for a transfer climate instrument but found a substantially different factor structure that suggested a different direction for transfer climate instrument research. Results suggest trainees perceive climate more according to referent to the organization rather than the psychological cues proposed. "Transfer of Training in a Corporate Setting: Testing a Model" (Esther W. M. Gielen) reports development of a transfer of training model that contains the three categories of major transfer influencing factors--characteristics of trainee, training design, and work environment--and their relation with learning and performance. It presents results of the model's test in a corporate setting that indicate the trainee's self-efficacy and the supervisory support are important factors. "Integrating Work and Learning for Superior Performance" (Joel R. Montgomery, Chak C. Lau) introduces an Integrative Learning Model and four interwoven, interactive support components that facilitate integrating work and learning and foster enhanced learning transfer and superior performance. Ppaers contain references. (YLB)

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SYMPOSIUM
[18] TRANSFER OF TRAINING

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Validation of a Transfer Climate Instrument
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Transfer of Training in a Corporate Setting: Testing a Model
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Integrating Work and Learning for Superior Performance
Joel R. Montgomery, Andersen Consulting LLP
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Validation of a Transfer Climate Instrument

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Rouiller and Goldstein (1993) proposed an eight factor structure for a transfer climate instruments but were unable to validate the structure due to inadequate sample size. This study attempted to validate their hypothesized structure. A substantially different factor structure was found suggesting a different direction for transfer climate instrument research. Results suggest trainees perceive climate more according to referent in the organization rather than the psychological cues proposed.

Investment in training activities aimed at improving employees' job performance represents a huge financial expenditure in the United States. It has been conservatively estimated that at least $100 billion is spent by US employers annually on training and development interventions. Of this expenditure, as little as 10% is projected to pay off in performance improvements resulting from the transfer of learned knowledge, skills, and abilities to the job (Baldwin & Ford, 1988). Indeed, it has been projected that the 'transfer problem' is so pervasive that there is rarely a learning-performance situation in which such a problem does not exist (Broad & Newstrom, 1992).

Transfer of training can be defined as the degree to which trainees apply the knowledge, skills, behaviors, and attitudes learned in training to their jobs. Transfer of training is seen as a function of factors in the formal training environment designed to facilitate transfer such as training content or design factors (Noe, 1986) as well as factors in the work environment (Tannenbaum & Yukl, 1992). Although a good deal of research has been done on design factors, significantly less has been done to understand how work environment factors influence transfer of training (Baldwin & Ford, 1988).

One conceptualization of the manner in which work environment factors affect the transfer of learned behaviors to the job is through a transfer of training climate. The construct of transfer climate is seen as a mediating variable in the relationship between the organizational context and an individual's job attitudes and work behavior. Thus, even when learning occurs in training, the transfer climate may either support or inhibit the application of learned behaviors on the job (Mathieu, Tannenbaum, & Salas, 1992).

Several studies have established that transfer climate can significantly affect an individual's ability and motivation to transfer learning to job performance (Rouiller & Goldstein, 1993; Tracey, Tannenbaum, & Kavanaugh, 1995) These findings have led an increasing concern about how to operationalize and measure the construct validly and reliably. The purpose of this study is to move toward the goal of a general transfer climate instrument by validating the transfer climate constructs and instrument proposed by Rouiller and Goldstein (1993).

Current Transfer Climate Research

From a practical perspective, measuring transfer of training climate is important because it helps HRD move beyond the question of whether training works to why training works (Tannenbaum & Yukl,

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1992). From an HRD evaluation perspective, without controlling for the influence of transfer climate, evaluation results are likely to vary considerably and yield erroneous conclusions about the causes of intervention outcomes (Holton, 1995). A valid and reliable measure of transfer climate is also important because such an instrument can identify when an organization is ready for a training intervention and it can provide information to guide pretraining interventions aimed at increasing training effectiveness. From a theoretical perspective, identifying and measuring the dimensions of the work context that impact the use of learned skills and behaviors provides a more complete conceptual framework of training effectiveness.

There are several critical assumptions that accompany the use of climate as a variable in explaining the transfer of training. First, climate, as a general construct, is defined as a psychologically meaningful description of the work environment (James & Jones, 1974; Jones & James, 1979). This conceptualization specifies that transfer climate is not the work environment per se nor the way people respond to it. Rather, it is the interpretative or "perceptual medium" (Kopelman, Brief, & Guzzo, 1990) through which the work environment affects job attitudes and behaviors. Transfer climate can thus be described as a "sense of imperative" (Schneider & Rentsch, 1988) arising from a person's perceptions of the work environment which influences the extent to which he or she is able to apply and utilize learned skills on the job. This cognitively based, individual level variable is assumed to be generalizable across organizational groups and units based on (1) the similarity of objective structural characteristics from unit to unit or group to group within an organization; (2) the selection, attraction, and attrition of organizational members (see Schneider, 1987); and (3) the shared meaning which develops out of the social interaction of organizational members (Schneider & Reichers, 1983). These factors arguably justify the aggregation of transfer climate data for the purposes of analysis at other levels such as group, unit or organizational levels (James, Jones, & Ashe, 1990). Finally, it is assumed that there are a limited number of factors that comprise the transfer climate construct and that, within these factors, there are reliable differences in specific climate factors (e.g., social support) across organizational units as well as across organizations.

Rouiller and Goldstein (1993), following Rouiller (1989), offered a conceptual framework based on Luthans and Kreitner's (1985) organizational behavior modification model for operationalizing the transfer climate construct. These authors proposed that transfer climate consisted of two general types of workplace cues comprising eight distinct dimensions of transfer climate (see Exhibit 1). The first set of workplace cues, situational cues, serve to remind or provide the opportunity for trainees to use what they have learned on the job. Situational cues were proposed to have four dimensions: (1) Goal cues (2) social cues (3) task cues and (4) self-control cues. The second set of workplace cues, consequence cues, refer to on the job outcomes which affect the extent to which training is transferred. Consequence cues were also presumed to have four dimensions: (1) positive feedback (2) negative feedback (3) punishment and (4) no feedback.

Exhibit 1. Definitions of Transfer Climate Constructs (Rouiller & Goldstein, 1993, p. 383)

Situational cues Cues that serve to remind trainees of their training or provide them with an opportunity to use their training once they return to their jobs.

> ***Goal cues***. These cues serve to remind trainees to use their training when they return to their jobs; for example, existing managers set goals for new managers that encourage them to apply their training on the job.
>
> ***Social cues***. These cues arise from group membership and include the behavior and influence processes exhibited by supervisors, peers and/or subordinates; for example, new managers who use their training supervise differently from the existing managers. (This is reverse-scored.)
>
> ***Task cues***. These cues concern the design and nature of the job itself; for example, equipment is available in this unit that allows new managers to use the skills they gained in training.

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Self-control cues. These cues concern various self-control processes that permit trainees to use what has been learned; for example, "I was allowed to practice handling real and job-relevant problems."

Consequences. As employees return to their jobs and begin applying their learned behavior, they will encounter consequences that will affect their further use of what they have learned. A number of different types of consequences exist.

Positive feedback. In this instance, the trainees are given positive information about their use of the trained behavior; for example, new managers who successfully use their training will receive a salary increase.

Negative feedback. Here, trainees are informed of the negative consequences of not using their learned behavior; for example, area managers are made aware of new managers who are not following operating procedures.

Punishment. Trainees are punished for using trained behaviors; for example, more experienced workers ridicule the use of techniques learned in training. (This is reverse-scored.)

No feedback. No information is given to the trainees about the use or importance of the learned behavior; for example, existing managers are too busy to note whether trainees use learned behavior. (This is reverse-scored.)

In a study of fast food restaurant management trainees, Rouiller & Goldstein (1993) used this hypothetical framework and demonstrated that aggregated unit level perceptions of transfer climate added significantly to the explained variance in posttraining job performance after controlling for learning and unit performance. In a multiple regression analysis, learning accounted for 8% of the variance in transfer behavior, but learning and transfer climate together accounted for 54% of the variance. The two sets of workplace cues, situational and consequence cues, were each found to add significantly to the explained unique variance. However, the authors did not test the factor structure of the scales. Their study derived the scales based on expert judgements, not factor analysis. Thus the only data reported were the within group interrater agreement estimates. In short, this study did not validate the proposed dimensions or subscales in the transfer climate construct.

Tracey et al. (1995), following Tracey (1992), attempted to replicate and extend the work of Rouiller and Goldstein (1993) using items drawn from their instrument along with an additional dimension of the work context termed continuous learning culture. This study of the transfer of training behavior of managers in a supermarket chain used 33 of the items from Rouiller & Goldstein's transfer climate instrument in addition to 24 items designed to measure continuous learning culture. These authors did not include Rouiller & Goldstein's hypothesized self-control scale in their instrument, reasoning that it was not a measure of transfer climate because the scale referred to "personal experiences relating to the use of training on the job, rather than perceptions about the transfer of training climate" (Tracey, 1992, p. 69).

A series of LISREL analyses revealed that both the climate and culture constructs explained a significant amount of variance in posttraining job behavior. A confirmatory factor analysis yielded a two factor model with six transfer climate scales factoring into a single scale and three proposed continuous learning culture scales factoring to a single scale. An exploratory factor analysis conducted by Tracey (1992) to clarify the underlying factor structure of both the climate and culture constructs retained nine interpretable factors. The transfer climate scales produced by this analysis were similar in some respects, but not identical, to those proposed by Rouiller and Goldstein (1993). As Tracey et al. (1995) noted, this is not surprising based on the different analytical methods used in scale derivation in the two studies.

Taken together these studies make it difficult to determine with any certainty the degree to which the transfer climate constructs and corresponding scales hypothesized by Rouiller and Goldstein are valid. Nevertheless, these results strongly indicate the presence of an interpretable transfer climate structure suggesting the need for further research to establish and clarify the nature of that structure.

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Method

This study was conducted as part of a larger evaluation study of a computer-based training program implemented to deliver OSHA mandated plant operator training. A variety of instruments were administered to participants, including the transfer climate instrument reported on here.

Sample The participants in the study included 189 operating technicians from four production units at a petrochemical manufacturing facility.

Measures Transfer climate was assessed using an instrument containing 48 items developed by Rouiller and Goldstein (1993) to represent the eight proposed dimensions. Because the items were not included in their article, we contacted the authors directly to obtain the items. Their original instrument contained 63 items but fifteen items were eliminated in this study because they were not appropriate for this organization. Seven of those eliminated were "self-control" items because this training was for operational procedures that were written by the trainees and for which application was not optional. Three items were also dropped from the social cue set and three from the negative feedback set. In the final instrument the number of items per scale ranged from 2 (negative feedback) to 17 (social cues). All items used a five point Likert type scale ranging from strongly disagree (1) to strongly agree (5). The items were used verbatim where possible but some were revised as needed to reflect appropriate terminology for the organization and the type of training being conducted. The changes did not alter the underlying constructs measured by the items.

Analysis Exploratory common factor analysis was conducted to identify the underlying latent structure of the data. Common factor analysis is more appropriate than principal components analysis when the objective of the analysis is to identify latent structures, rather than for predictive purposes (Nunnally & Bernstein, 1994). An oblique rotation was used because it is also more appropriate for latent variable investigation when latent variables are expected to have some correlation.

Results

Kaiser's measure of sampling adequacy (MSA), a measure of the data set's appropriateness for factor analysis, was .905. Values above .90 are considered very appropriate for factor analysis (Hair, Anderson, Tatham, & Black, 1995). Six factors emerged with eigen values greater than one, explaining 81.6% of the variance. Of the 48 items on the instrument, 40 loaded .40 or higher on these six factors and were retained for further analysis. This is a conservative cutoff for factor loadings and more items could have been retained if the cutoff had been .30. However, reliability analysis including items loading slightly below .40 showed that the reliability would be reduced by including them. One item had an MSA in the unacceptable range and was dropped from further analysis, leaving 7 items that did not load on any factor.

Loadings reported in Table 1 were characterized by interpretable simple structures. Importantly, items yielded exceptionally clean loadings with average loading greater than .50 on the major factor and less than .20 on all factors for all scales. We further examined the stability of the factor structure across different factor analysis methods. The factor structure was identical when the common factor analysis was repeated with an orthogonal (varimax) rotation.

Analysis of the item content and the original proposed theoretical framework led to the six factors being identified as shown in Table 1. They are: supervisor support, transfer design, peer/job support, supervisor sanction, personal outcomes-positive, personal outcomes-negative.

Table 1 Factor Loadings for transfer climate items

Item Number	1	2	3	4	5	6
Supervisor Support (avg. loading, major factor = .613; other factors = .111)						
12	.81	.04	.02	.13	-.11	-.10
8	.77	.02	-.04	.07	.03	.15
27	.75	-.14	.20	.03	.07	-.14
4	.73	.15	-.16	.08	.13	-.02
1	.73	.04	-.12	.10	.10	.11
15	.73	-.18	.33	-.06	-.08	-.11
13	.71	.08	-.03	-.08	-.10	.06
2	.69	.15	-.20	.02	.19	.01
14	.60	.00	.18	.07	.06	-.01
11	.56	.18	.06	-.18	-.25	-.01
26	.55	-.12	-.12	-.16	.01	.30
5	.54	.28	-.19	-.03	.06	.00
10	.53	.05	-.09	-.22	-.08	.27
9	.50	.16	.01	.00	-.06	.19
23	.49	-.07	.30	.13	-.15	.17
24	.48	-.05	.13	-.07	.27	-.05
38	.46	.04	.24	-.01	.11	.13
16	.41	-.10	.23	-.33	.00	.11
Transfer Design (avg. loading, major factor = .694; other factors = .088)						
64	.03	.79	-.05	.02	-.03	-.29
63	.08	.70	.19	-.02	-.08	.04
66	.07	.69	.15	.05	.06	-.07
65	.19	.65	.23	.06	.03	-.09
62	.16	.64	.13	.03	.01	.03
Peer/Task Support (avg. loading, major factor = .474; other factors = .136)						
31	-.03	.15	.53	-.18	.14	.08
37	.18	.19	.51	.02	-.13	.04
30	-.10	.08	.46	-.22	.17	.16
41	-.10	.24	.44	-.11	.05	.19
36	.23	.12	.43	-.02	.21	-.15
44	-.07	.38	.43	.20	.08	.23
55	.02	.00	-.48	.21	.23	-.11
45	.09	-.24	-.51	-.15	-.01	-.15
Supervisor Sanction (avg. loading, major factor = .560; other factors = .084)						
18	.08	.05	.01	.63	.00	.03
21	-.21	-.06	-.11	.59	-.02	.07
29	.00	.08	-.20	.56	.02	.18
22	-.26	.01	-.16	.46	-.05	.08
Personal Outcomes - Positive (avg. loading, major factor = .583; other factors = .071)						
52	.05	.01	-.02	-.12	.69	-.01
51	.06	-.02	-.01	.15	.68	.04
59	.10	-.19	-.12	.10	.38	.06
Personal Outcomes - Negative (avg .loading major factor = .595; other factors = .145)						
54	.04	-.02	.16	.15	-.05	.63
53	.22	-.24	.20	.17	.20	.56
EIGENVALUES	14.691	2.689	1.762	1.408	1.0773	1.000
% VARIANCE EXPLAINED	54.01	9.89	6.48	5.17	3.96	3.68

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Table 2 contains means, standard deviations, and internal consistency reliability estimates for unit weighted combinations of items loading dominantly on each factor. Five of the six scales exceeded Nunnally & Bernstein's (1994) suggested minimum reliability of at least .70 for instruments in early stages of development, with an average alpha of .78.

Table 2 - Descriptive statistics for scales

Scale	# Items	Alpha	Mean	SD
Supervisor Support	18	.94	3.46	.60
Job/Peer Support	8	.81	3.56	.58
Supervisor Sanction (reversed)	4	.73	3.64	.69
Personal outcomes-positive	3	.70	3.07	.82
Personal outcomes-negative (reversed)	2	.67	3.05	.84
Transfer Design	5	.88	3.70	.61

Discussion

Rouillier and Goldstein's hypothesized structure of transfer constructs was generally not supported. Their structure suggested that people perceive transfer climate by psychological cues (i.e. goal cues, social cues, etc.). This analysis suggests that they perceive climate according to the referent of the climate (supervisor, peer/task, or self). Exhibit 2 illustrates conceptually how items loaded in this analysis. If Rouiller and Goldstein's structure were supported, the highlighted blocks would be horizontal by row. Instead the items loaded by referent, suggesting that climate perceptions are structured by whether the construct pertains to their supervisor, their peer/task, or themselves.

Exhibit 2 - Conceptual factor structure

Construct	Referent/Num Items			
	Supervisor	Peer/Task	Self	Not load
CLIMATE				
Goal	3	1		1
Social	12	2		3
Task		3		1
Positive Feedback	3	1	2	0
No Feedback	2		1	0
Punishment	2	1		2
Negative Feedback			2	0
TRANSFER DESIGN (Self-control)	5			0

Even the macro structure of "situational" cues and "consequences" proposed by Rouiller and Goldstein is called into question by this analysis. For items referring to supervisors, "positive feedback" items loaded with goal and social cues, indicating that they were not perceived as a consequence, but rather as another form of support. Items referring to negative supervisor consequences did load together. Items referring to the immediate work environment (peers and task) all loaded together, indicating respondents perceived no distinction between situational cues and consequences. Items that were self-referent loaded into two factors reflecting positive and negative consequences. Thus, one can not conclude from this analysis that the macro structure is valid.

The only set of items that loaded as expected were the self-control items. However, we agree with Tracy (1992) that these are not really climate items. The self-control cue items address the extent to which the training enables trainees to transfer learning to the job. What these items really measure is the adequacy of the training design, which has been labeled "transfer design" (Holton, 1996). This is a very important construct which assesses the degree to which training gives the trainee the ability to transfer learning, but it is not a part of the transfer climate.

This analysis suggests the following constructs:

Transfer Climate

- *Supervisor support* The extent to which supervisors reinforce and support use of learning on the job. Examples include setting goals to use learning, giving assistance, offering positive feedback.
- *Peer/task support* The extent to which peers and the task itself reinforce and support use of learning on the job. Examples include setting goals to use learning, giving assistance, offering positive feedback, and having similar equipment as used in training..
- *Supervisor sanctions* Negative responses of the supervisor if training is not used on the job. These may include negative feedback, punishment, and no feedback at all.
- *Personal outcomes - positive* The degree to which applying training on the job leads to outcomes that are positive payoffs for the individual. These may include raises, advancement, etc.
- *Personal outcomes - negative* The degree to which applying training on the job leads to outcomes that are negative for the individual. These may include reprimands, being overlooked for raises, etc.

Transfer Design

The extent to which training has been designed to give trainees the ability to transfer learning to job application and the training instructions match the job requirements. This may include designs that include practice, experiential activities, and real world requirements.

One possible limitation of this study is the fact that a number of items were dropped from Rouiller and Goldstein's original instrument which precludes drawing general conclusions about all of their scales. However, these results suggest a very different conceptual structure for transfer climate measurement which we believe was not affected by the items dropped. Their instrument development process was also built on deriving climate items that were appropriate for the organization in their study. Climate instruments will likely always require some modification across organizations. The next research step should be to further refine the item set for these constructs and then conduct criterion validity studies.

We suggest though that an important goal for transfer researchers should be the identification of generic transfer constructs present in every training situation and the development of accepted procedures for constructing appropriate items to assess those constructs. Without that, cross study analysis will be very difficult. Currently, various conclusions are being drawn in studies about the importance of transfer climate while using a variety of instruments of varying quality. Serious research is needed to develop the psychometric integrity of transfer instruments before more definitive conclusions about the relationship of transfer climate to individual performance outcomes are possible.

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Transfer of Training in Corporate Setting: Testing a Model

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In the field of HRD transfer of training is of particular interest because of its link with training effectiveness. In general, three categories of transfer influencing factors are distinguished: characteristics of trainee, training design, and work environment. Based on a review of existing research a new transfer of training model is developed. This model contains the major influencing factors and their relation with learning and performance. The transfer of training model is tested in a corporate setting. Results indicate that trainee's self-efficacy and the supervisory support are important factors.

The importance of training effectiveness is frequently stressed in the field of human resource development. Training is considered to be effective when trainees can apply their learning to their work situations, and consequently, when their performance on the job improves. However, training appears not to be as effective as is desired or needed. Broad and Newstrom (1992, p. ix) stated, for example, that most of the investments in training and development is wasted because most of the knowledge and skills gained in training (well over 80 percent by some estimates) are not fully applied by those employees on the job. Baldwin and Ford (1988, p. 63) stated that 10 percent or less of expenditure on training actually results in transfer to the work environment.

In general the lack of transfer of training is seen as the main cause for these losses. Transfer of training is referred to as the degree to which trainees effectively apply knowledge, skills, and attitudes, gained in a training context, to the work situation. This definition has three implications. Firstly, it implies that there is something to transfer: the knowledge, skills, and attitudes gained in a training context. In other words, learning must have occurred. Secondly, the trainee should be both able and motivated to transfer the training. Finally, there is the situation, different from the training context, in which the training content is applied. In other words, there are a lot of factors that may influence transfer of training (and therefore performance) positively or negatively. The focus of this study was to identify and test the effects of these influencing factors.

Method

Available literature on the influencing factors in training design, trainee, and work environment was reviewed. A particular effort was made to explore research conducted in a corporate setting, which used vocational or professional oriented training programs. Based on this empirical material a transfer of training model was constructed, in which the most important influencing factors in trainee and work environment and their relations with learning and performance were presented (see Figure 1).

Then the validity of the transfer of training model was examined in a corporate setting provided by a large international Dutch banking organization. A program for computer assisted instruction for desk clerks concerning 'Legal Aspects' was selected. It consisted of a computer program and a textbook, and was concluded with an (optional) examination provided by the training department. The affiliated banks purchased the training material from the training department. The individual banks decided on how and when to use the training programs, as no strict guidelines were offered by the training department.

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Data on the variables in the model were collected by means of four observations taken before the training (O1), immediately after the training (O2), approximately one month after the training (O3), and approximately three months after training (O4). The instruments used to collect the data, consisted of questionnaires and tests, and a log. The questionnaires, the log and the transfer test were designed, tested and revised for this study. For the pretest and posttest the tests designed by the bank's training department were used.

Two groups of respondents were established: one group received all measurements, while the other group (the comparison group) only received a selection. The trainee's supervisor also completed a questionnaire, which coincided with the last observation for the desk clerks. The sample consisted of 112 respondents: 75 in the so called treatment group, 37 in the comparison group. The collected data were analyzed by means of methods of multiple regression analysis and intercorrelation.

The potential weaknesses of the design were investigated and it was concluded that the collected data were internally valid. Additionally, the reliability of the various variables incorporated in the questionnaires were examined, and were in general found to be satisfactory. Finally, the two groups in the sample were compared with no systematic differences being found. The sample was also found to be representative for the population of desk clerks.

The Transfer of Training Model

The model presented here is the result of an effort to synthesize pieces of empirical evidence into a more comprehensive view on the transfer of training process in the context of corporate training. In the transfer of training model (see Figure 1) the influencing trainee characteristics and work environment characteristics have been incorporated.

Trainee Characteristics. In general, trainee characteristics appear to influence behavioral change, although Baldwin and Ford (1988) have stated that the extent and direction is not agreed upon and although characteristics are being examined separately. For the purpose of this study the trainee characteristics that appear to have the most influence on the transfer of training process have been selected.

Ability. It is apparent that an individual's ability determines a vast amount of the variance in learning outcomes. Not only the accumulated skills from past experience with similar tasks (prior knowledge), but also the flexible adaptation of skills to a novel learning task (Clark & Voogel, 1985) are considered.

Self-efficacy and Learning Style. Personality factors that seem important are self-efficacy and learning style. Self-efficacy is defined as 'the individual's expectation or confidence that tasks can be successfully performed' (Ford, Quinones, Sego, & Speer Sorra, 1992). The underlying hypotheses are that individuals high in self-efficacy are more likely to be active in trying out trained tasks and attempting more difficult and complex tasks on the job (Ford et al., 1992) and that there is a positive relation between self-efficacy and perceived frequency of use of skills (Ameel, 1992, p. 72).

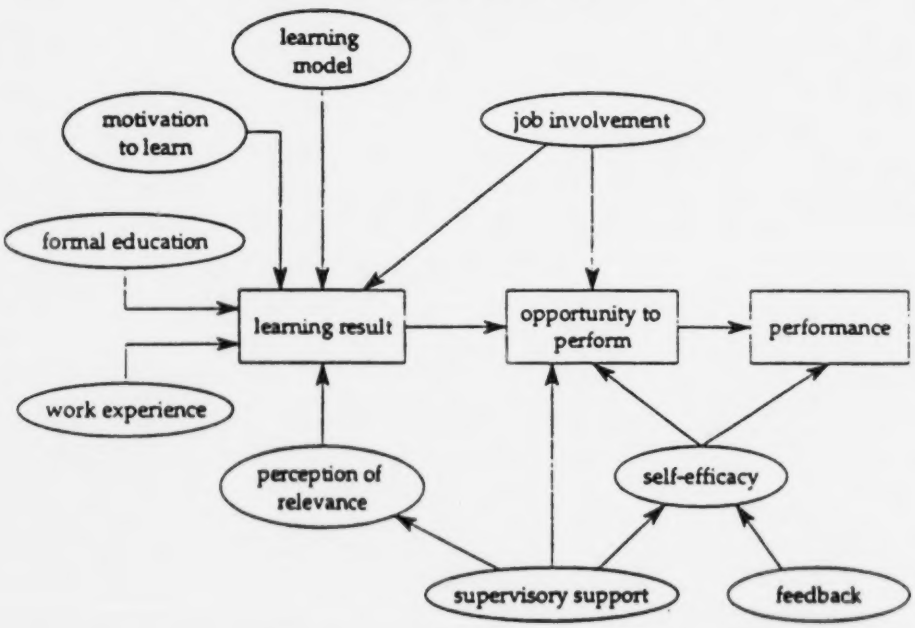
Learning style is the composition of learning activities, orientation toward learning and the mental model of learning that an individual possesses (compare Vermunt, 1992). Together these aspects appear to determine a large part of test results.

Job involvement and Perception of Relevance. Important motivational factors are job involvement and perception of relevance. *Job involvement* is defined as 'the degree to which the trainee identifies psychologically with the work, or the importance of the work for the individual's total self image' (Noe, 1986, p. 742). Hypotheses indicate that job involvement is positively correlated with learning (the amount of acquired knowledge), and with frequency of training use and through this indirectly with behavior change. Besides, it is critical to explain the relevance of the task to be mastered to the trainees' current jobs or future employment opportunities (Ameel, 1992, p. 40).

If the trainee does not have an accurate perception of the training's relevance it is probable that he will not learn to do anything he could usefully do on the job. Therefore it is

expected that the trainee's perception of relevance of the training content is related to the so-called motivation to learn (before the training program) and the motivation to transfer (after finishing the training program). In the first instance the perception of relevance is probably based on information on the training content provided by the training department, supervisor, and colleagues. In the second instance it will stem from first hand experience in the training program and the trainee's opinion of its relevance for the actual job. Perception of relevance is hypothesized to have a positive correlation with learning and with the frequency of training use.

Figure 1. The transfer of training model



Work Environment Characteristics. The work environment comprises all of the conditions in which an employee has to perform the tasks and duties belonging to his or her function. Within this environment certain variables influence either positively or negatively the individual's capacity to transfer training to the workplace. The most important influencing factors are derived from the relation between the trainee and his or her supervisor. Here important factors are supervisory support, feedback and opportunity to perform.

Supervisory Support. The perception of the supervisory support is determined by the activities the supervisor performs before, during and after the training program. The amount of support influences the trainee's perception of the importance of the training program and of the supervisor's trust in the trainee's ability to perform. In turn, the trainee's perception of relevance is effected and an actual effort to transfer is made (motivation to transfer). Furthermore, there appeared to be a link between supervisory support and the frequency of training use.

Feedback. From the research on the influence of feedback it was concluded that feedback from supervisory and organizational sources was related to reported job performance while feedback from peers and self was not. Most of the unique variance in performance explained by feedback was also accounted for by feedback from these sources. Negative expressions or consequences (e.g. no recommendation for a promotion) were related to lower performance, and positive job changes, expressions or formal recognition (e.g. increasing responsibility) were related to higher performance. It is hypothesized that the trainees' perception of the feedback

influences (either positively or negatively) the trainee's self-efficacy and thus indirectly performance on the job.

Opportunity to perform. A final important factor on the transfer of training due to the work environment are the opportunities the trainee encounters to practice the newly learned skills. This opportunity to use or opportunity to perform is defined as the extent to which a trainee is provided with or actively obtains work experiences relevant to the tasks for which he or she is trained (Ford et al., 1992). Issues to consider are, for example, the number of trained tasks the trainee actually performed on the job, the number of times a task is performed, or the overall perception of difficulty and complexity of the performed tasks (in case a trainee happens to perform only the relatively easy tasks). It was concluded that the degree of opportunity to perform was influenced by the supervisor.

Training Design Characteristics. It was concluded that achieving transfer depends on two things. On the one hand the trainee must gain sufficient knowledge of and exercise on a specific task to master it (declarative and procedural knowledge). Training must therefore rely on the crucial elements in the transfer task and train these elements in the learning environment: similarity of tasks. On the other hand the trainee must have sufficient conditional knowledge in order to decide if it is appropriate to apply mastered knowledge and skills. To accomplish this attention must be given to variability of tasks. The bottom line is that training must offer opportunity to both task performance and decontextualization.

Training objectives aiming at near transfer (low-road transfer, automatic processes) or that have a procedural nature ask for knowledge that is context bound. To accomplish this knowledge must be introduced in the context it will be used and behavioral oriented training methods are needed. When training objectives aim at far transfer (high-road transfer, controlled processes) and are of a declarative nature then the students must be stimulated into generalizing and making analogies in order to render knowledge less context-bound (decontextualization). This can be accomplished by offering varied examples and using cognitive oriented training methods.

From the literature examined several assumptions can be formulated about the increase of transfer. Near transfer is promoted by: introducing knowledge in the context it will be used; behavioral objectives that guide instruction, and the presence of identical elements in tasks in training and in job environment promotes transfer. Far transfer is promoted by: introducing varied context, which leads to decontextualization of learning, stimulating generalization and analogies, discovery strategies, and a sequence by increasing diversity, which in turn decreases contextual bindings.

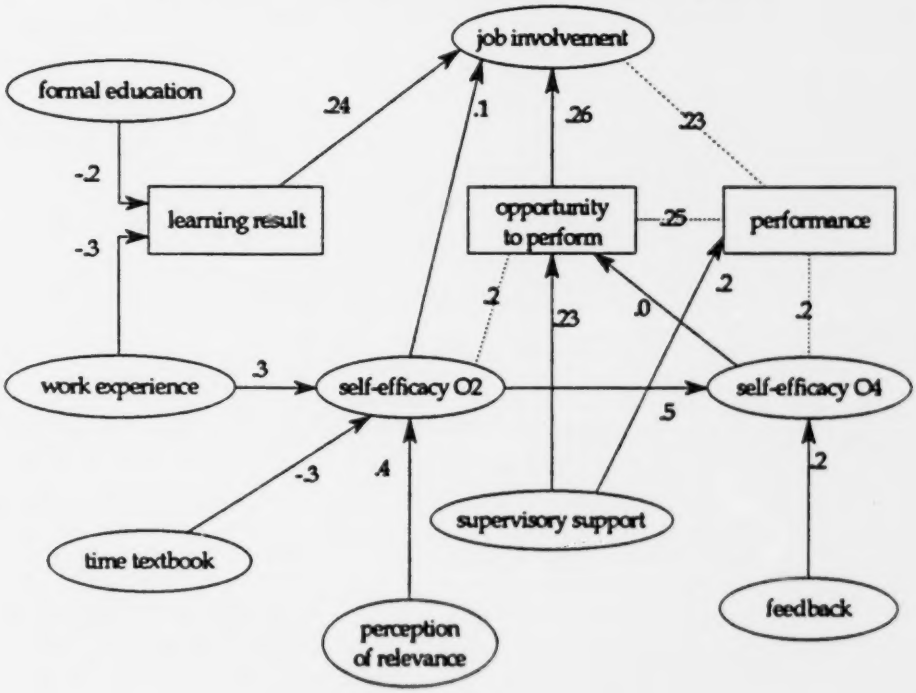
As can be observed no training design characteristics have not been included (yet) in the transfer of training model. The reason for this being the lack of variation in the training design because this study was conducted with one training program.

Results

In the transfer of training model, several relations between trainee characteristics, work environment characteristics and the learning result and performance were hypothesized. In Figure 2 the relations confirmed by means of the analyses of regression and intercorrelations are recapitulated. The straight lines refer to the results from regression analyses and the corresponding Beta-weights, the dashed lines refer to the amount of intercorrelation (r^2).

From Learning Result to Performance. In the model it was hypothesized that the learning result would positively affect opportunity to perform, and in turn, that opportunity to perform would affect performance positively. The data provided no evidence for the confirmation of these hypotheses, although opportunity to perform was positively related to performance.

Figure 2 The confirmed relations of the transfer of training model



The limited range in the scores of all three variables may have contributed to the lack of significant results (see also Hastings, 1994, p. 102). First, the learning result did not vary widely because the pretest score was already very high: about 80% of the trainees would have passed the examination criterion used by the bank's training department before entering the training (ceiling effect). Nevertheless, a significant learning result was measured. It was also concluded that the learning result was negatively affected by work experience and formal education, but this was explained by the positive influence these two variables have on the pretest score. Secondly, the score for opportunity to perform didn't vary very much either. This was due to the fact that, in general, the desk clerks are not able to regulate the number of opportunities they encounter in which they can perform the learned behavior, but the client's requests do. And thirdly, the performance assessment by the supervisor didn't show much variability either. All desk clerks have experience in performing these specific tasks, and probably the assessment instrument didn't provide the supervisor with a strong method to distinguish between the desk clerks. If, of course, there were actual differences in performance.

In summary, the desk clerks possessed already substantial work experience, in which they probably learned (on-the-job) how to perform the tasks. Consequently, the work experience influenced the test scores significantly. Nevertheless the hypothesized relations are still expected to occur when trainees do not have a high entrance level. These results are therefore considered as valid for this specific context and not necessarily in other circumstances.

Self-efficacy. The hypotheses that self-efficacy would affect both opportunity to perform and performance were only partially supported by the data. The mutually affecting relationship between self-efficacy and opportunity to perform is a very clear example of the mechanism Taylor, Locke, Lee & Gist (1984, p. 414) referred to: "..self-efficacy is reciprocally related to past performance, i.e., it is both a cause and an effect of performance". The finding that trainee's self-

efficacy immediately after the training was positively affected by work experience, is yet another confirmation of results in other research in which both ability and past performance have consistently been found to be positively related to self-efficacy (Lee & Bobko, 1994, p. 365; Taylor, Locke, Lee & Gist, 1984, p. 405).

Self-efficacy was not found to affect performance, but it was positively related to performance. A similar result was found by various researchers (e.g. Ameel, 1992; Ford, Quinones, Sego & Sorra, 1992). Only one case was found in which self-efficacy was reported to intervene between Type A behavior (involving job involvement, competitiveness) and performance (Taylor et al., 1984, p. 413).

Thus, opportunity to perform affects self-efficacy, and in turn, self-efficacy is positively related to performance. This assertion is analogous to Den Ouden's (1992) conclusion that perceived control is positively related to behavior, when it is supported by an intention to perform. In this study, the employee's behavior is regulated by the clients' requests. Ergo, the opportunity to perform regulates performance instead of the intention to perform (motivation to transfer). The chain of reasoning is therefore as follows: the self-efficacy (perceived control) is related to performance when it is supported by opportunity to perform. The results of this data set validate this assertion to a great extent.

In summary, in this study trainee's self-efficacy is an important variable, maybe more important that the learning result. However, in the preceding section as has already been explained, the lack of significant effect from learning was due to the work experience.

Supervisory Support. Supervisory support was assumed to affect performance through the trainee's self-efficacy. The data showed that the perceived supervisory support affected opportunity to perform and performance, but not the trainee's self-efficacy. This result is not consistent with the assertion of Hastings (1994, p. 11) who reasons that "..since self-efficacy is related to performance, the impact of supervisory support and involvement, and situational constraints in any given context is mediated by the interaction of these variables and the trainee's self-efficacy..". Also, Gielen en Van der Klink (1995) synthesized the results of four studies, and concluded that no convincing evidence was found to support the premise that supervisory support directly contributes to trainee's performance. In fact, in studies where the supervisory support was controlled, only a part of the assumed direct effects were confirmed. Gielen and Van der Klink proposed that more powerful interventions of supervisory support are required to promote transfer directly, and more powerfully.

Another finding that was not assumed in the model was the reciprocal effect of perceived relevance of the training program and perceived supervisory support. This finding is consistent with the suggestion that employee motivation can be profoundly affected by management actions which, either intentionally or unintentionally, send salient cues or signals (Baldwin & Magjuka, 1991, p. 26). From their research Baldwin and Magjuka concluded that the mandatory status of a training program and the trainee's accountability to a supervisor affected motivation to transfer. In other words, when an employee perceives that the supervisor is supporting the training program, he or she will assume that this training program must be important or necessary.

Nevertheless, these results provide some evidence for the various models that describe supervisory activities before, during, and after training, which are assumed to enhance transfer of training (e.g. Broad, 1980, 1982; Gradous, 1991; Robinson & Robinson, 1989). From this study it can be concluded that supervisory support can certainly affect performance, although providing support was not part of any treatment or due to prescriptions of any kind. Given this fact, the effects of a combination of controlled supporting activities may be significantly larger than the effect found in this study.

Differences between Supervisors. At the start of this study no assumptions were formulated with respect to differences between supervisors. Two facts appeared: one being the supervisory support to affect performance, and the other being the supervisors providing this influencing support resided at various banks from different types and in different parts of the country. Therefore it was investigated whether differences between these supervisors existed. The

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data indicated that significant differences existed between supervisors for the pretest score and the learning result. Apparently the training program was used differently by the supervisors: in some cases as initial training, and in other cases as refresher training. This could occur because the training department does not prescribe how and when to use the training program.

In addition, the trainee's perception of supervisory support varied significantly for different supervisors, and the supervisor's perception of trainee's features (e.g. job involvement, self-efficacy) was also significantly different. It is not unreasonable to assume that similar patterns will also occur in other settings, because supervisors are likely to have different perceptions on providing support, and consequently are likely to differ in actual provided support. These results can offer an explanation for the studies in which supervisory support was not found to affect performance. It is possible that when analyses are separated for different supervisors larger effects of support can be calculated.

Discussion

Firstly, the transfer of training model that was developed based on the literature review is perceived as output from this study. Secondly, this model was tested in the context of corporate training. In the previous section the more important results have been summarized and discussed. The relations that were assumed in this model were partially confirmed by the data. However, the model is not rejected or adjusted based on these results. One important reason for not rejecting the transfer of training model is that data were only available from one setting. As has already been indicated that unexpected effects were found, which were due to this one setting. These effects were primary due to the high work experience, affecting the learning result negatively. This influenced primarily the lack of evidence for the assumed relationships between learning result and opportunity to perform, and between opportunity to perform and performance. Of course, one can reverse this argument by not rejecting the model and stating that the relations confirmed by the data (as presented in Figure 2) were also due to this particular setting. This is certainly possible. Ergo, the transfer of training model will not be adjusted based on these results either.

Another result was the importance of the trainee's self-efficacy. It seems meaningful to discuss this issue although it is (again) specific to this study's setting. With the current focus on training effectiveness and reduction of training costs it may be profitable to reconsider the use of training programs. In this setting it appeared that work experience was a predicting factor for the pretest score, and for self-efficacy. Trainee's self-efficacy was in turn positively related to performance. With this mechanism in mind, one may consider to focus more on on-the-job training for tasks which can be expected to be learned relatively easy on-the-job. In this research setting, the tasks were not too difficult, so colleagues of the desk clerks could assist and/or explain how to perform.

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Note: This paper is based on a dissertation published in the Netherlands. It is possible to purchase it from the author.

Integrating Work and Learning for Superior Performance

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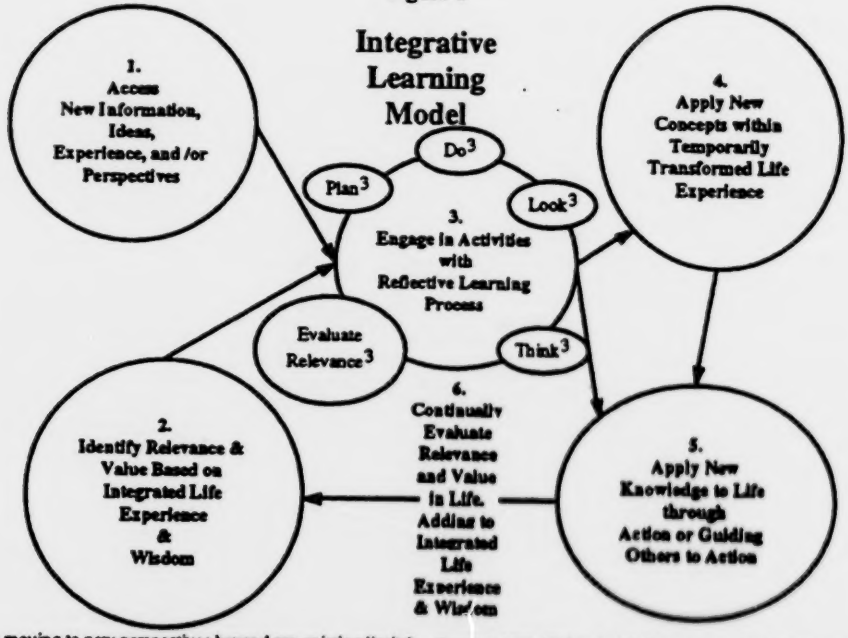
Worldwide, corporate education programs need to adapt to an accelerated pace of change and to increase learning transfer and superior on-the-job performance by learners. This paper introduces an Integrative Learning Model and four interwoven, interactive support components that facilitate integrating work and learning and foster enhanced learning transfer and superior performance.

Corporations throughout the world are undergoing an accelerated pace of change that requires effective learning transfer and an increased ability for corporate professionals to be *reflective practitioners* (Schon, 1983). Teaching-focused (largely instructor-led, *push*) paradigms are giving way to learning-focused (*pull*) paradigms (Montgomery, 1994). For professional consultants working in a global arena, training, education, and employee development (three cornerstones for Human Resource Development) (Nadler, 1979) are evolving into a requirement for learning to be integrated with work and for work to be integrated with learning (Lau, Fisher & Busby, 1995; Lau, Fisher & Seaman-Anderson, 1995). This integration of learning and work is a major aspect of the "learning organization" (Senge, 1990). Integrating learning with life experience is essential for effective learning transfer (see figure 1) (Montgomery, 1992). It is important to note that this integrative learning process applies to learning "on-the-job" (an area of life experience) as well as to learning in a focused learning environment.

Figure 1


Integrative Learning Model
1. Access New Information, Ideas, Experience, and /or Perspectives
2. Identify Relevance & Value Based on Integrated Life Experience & Wisdom
3. Engage in Activities with Reflective Learning Process
Do3
Look3
Think3
Plan3
Evaluate Relevance3
4. Apply New Concepts within Temporarily Transformed Life Experience
5. Apply New Knowledge to Life through Action or Guiding Others to Action
6. Continually Evaluate Relevance and Value in Life. Adding to Integrated Life Experience & Wisdom

- (3 = moving to new perspectives beyond pre-existing limits) Copyright 1992, 1995 by Joel R. Montgomery. Used with permission.

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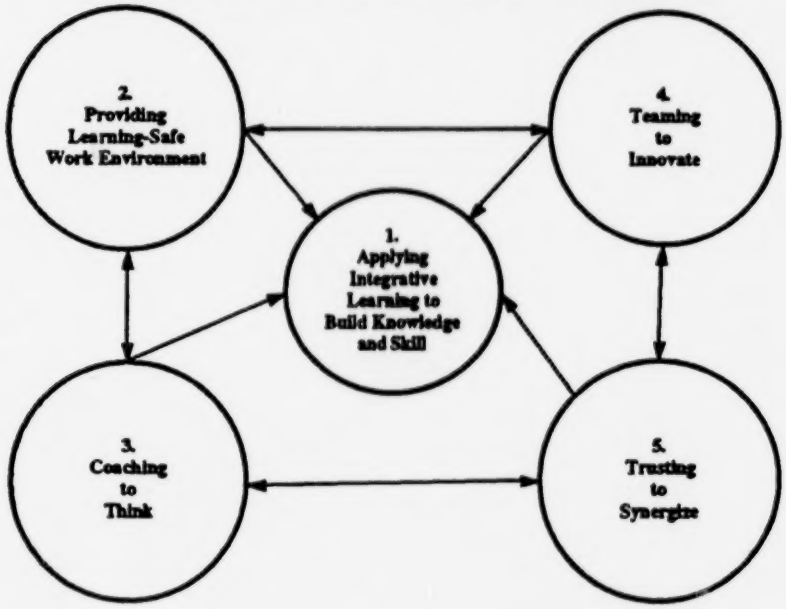
Integrative Learning

Each person brings to a potential learning experience the sum total of his integrated experience and wisdom. As he accesses the new information, ideas, experience, or perspectives, he begins to identify the potential relevance and value offered by the new experience. The next step is to work with the new information while engaging in activities involving the reflective learning process. As people move through the phases of the reflective learning process, they begin to integrate the new information with their life experience, potentially moving to new perspectives that allow them to move beyond pre-existing limits to thought, attitude, and action. Once the information is tenuously integrated, it is important for the learner to test the new information in a realistic context. When this produces satisfactory results, the learner will look for ways to apply the new concepts in work (life) contexts over time, always evaluating their effectiveness and relevance and deciding (consciously or not) whether or not to integrate the concepts fully into his life experience (Montgomery, 1992).

Figure 2

Support Components for Integrative Learning



Support Components

Four interwoven, interactive components support integrative learning in a corporate setting and lead to superior performance: *Learning-safe work* environment, coaching, teaming, and trusting (see figure 2). There are strong indicators that all these variables facilitate learning (Dean, 1995; Winslow & Bramer, 1994). Research has also indicated that transfer of learning is most effective when the learning environment resembles the work environment. Examples of these learning environments are classroom simulations, Microworld, and laboratory (Morecroft, 1994; Lane, 1994). Transfer can be even more successful when these same support components are present in both the learning and the *learning-safe* work environments. Artificial settings and the prefabricated material found in many learning environments are the possible barriers for direct

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learning transfer. Another barrier in successful transfer of new learning is a lack of reinforcement and resources experienced by the learner when she re-enters the work environment (when the work environment is not *learning-safe*).

Working to Learn

Workers are challenged to learn new procedures and whole new ways of working and of looking at work. In order for them to grow into new organizational expectations, they need to build the competencies (knowledge and skills) necessary to allow them to do the job in their work context. To support this learning, organizations need to facilitate the acquisition of these competencies in a *learning-safe work* environment where learning from both successes and mistakes is encouraged and supported. Because human learning builds on our integrated life experience, organizational learning environments need to account for that experience, to work with an understanding of integrative learning , and to create an environment where learners engage in work activities using the same resources they would have in the workplace.

Teaming to Innovate

Business and industry have used focused teams to invent and innovate products and services. The secret of team dynamics is the tremendous source of creative energy within the teams (Mink, Owen, & Mink, 1993). In order to unleash the energy source a team-based learn-by-doing strategy can elevate the team to superior performance. The critical requirements for such a team in an integrative learning environment include conversation to share, coordination to synthesize and collaboration to execute.

Conversation to share requires each team member to assume personal responsibility, involvement and control of dialogue and subsequent actions created. Each team member should be willing to challenge her favorite conviction and mental model so to let team ideas flow freely within the team. Through conversations, each team member should visit each other's mental model and learn from it through asking fresh questions not to interrogate but to integrate into crystallized team ideas. Coordinate to synthesize includes open communication among team members through learning others' insights by not evaluating but appreciating others' perspective and not insisting on anyone's own belief or position. With the goal to synthesize, the team will develop better understanding of the targeted issues or topics. Collaborate to execute involves a series of questions that leads the team to create an action plan. The questions are: What should we be doing? What is stopping us? What can we do about it? Once the above questions are dealt with, the following questions should be asked and answered: Who cares? (Who knows about the problem?) Who can? (Who cares about the problem?) and Who do? (Who can do something?) Once an action plan is developed as a team, a *What if* scenario planning should be used to ensure the execution plan is possible.

Coaching to Think

A coach or facilitator is essential for the focused learn-by-doing team. The coach is the resource person who is positioned to provide on-demand assistance in guiding the team's thinking. The coach will ask insightful and challenging questions (Argyris, 1993) to stimulate thinking by the team and by each team member. Structured facilitation is not encouraged because of the possibility of hindering the team's or member's self-awareness of gaining insights of the targeted issues or topics. Structured facilitation tends to put a leash on members' train of thoughts and leads to only linear and serial thinking mode instead of systemic thinking. It is important for the

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coach to encourage the team members to ask "fresh questions", share issues, analyze alternatives and execute agreed plans.

Trusting to Synergize

Trust is a key organizational as well as a teaming issue that permeates the organizational culture, the work team, and the learner. Gibb (1991) identified four stages of trust development in any group. These are: Trust, Openness, Realization, and Interdependence (TORI). As a learn-by-doing team evolves through each of the four stages, there is a greater likelihood for synergy to take place, allowing the possibility for the greatest gain from the learning experience. For learners to participate actively in learn-by-doing teams and apply the new knowledge and skills on the job, the organization needs to create an environment that encourages collaboration and trust both in and out of the learning setting. From a team member's perspective, trust is always a two-way street between team members. In the trust stage of development, team members begin to develop trust as a team by revealing themselves at a personal level to the team in a way that creates a personal contact rather than a facade of impersonal facts. When accomplished, this leads to the openness stage where team members share information freely without fear of attacking or being attacked on a personal level by other team members. In the realization stage, the foundation of trust between members allows the team to move into shared vision and common goals. In the interdependence stage, the members collaborate and take action both jointly and independently, knowing (and trusting) that the work of each member is for the benefit of the entire team. When the learn-by-doing team has established a foundation of trust and has moved through these four stages, the products they generate as a team (both in terms of task outcomes and learning) will show evidence of synergy (that is, will be better than products reflecting the combination of the best single efforts of each member of the team).

Hypothesis:.

Corporate learning experiences will result in superior on-the-job performance by learners when the principles of integrative learning are consciously applied and supported by these four interwoven, interactive, components: learning-safe "work" environment, coaching, teaming, and trusting.

Results and conclusion:

An earlier version of this model was used to teach human relations and reflection skills to more than 300 teachers-in-training at a public university in Florida (Montgomery, 1989). Learners demonstrated acquisition of desired competencies both in the classroom and in their private and professional lives (Montgomery, 1992).

The ideas proposed in this paper are still in a testing stage. Various elements suggested here have been used successfully for more than two years by a major international consulting firm in its professional development programs for more than 30,000 consultants in its global practice (Montgomery, 1994). The firm's successes to date have led to a commitment to create learning environments that help the firm's consultants build their skills as *reflective practitioners*. Some ongoing *learn-by-doing* research initiatives involving ideas proposed in this paper are listed below.

There is a lag time between the creation of new knowledge (learning) and its addition into the learner's integrated life experience and wisdom (see figure 1). Unless the learner is asked to apply this new knowledge immediately, it is difficult to measure the link between learning and transfer to the job. One way to create a more timely integration of the new

knowledge is to have the learners engage in learning while they are on the job and to ask them to apply what they are learning on the job as a part of the learning experience. This concept will be tested when a *proof-of-concept* proposal using integrative learning in a *virtual classroom* distance learning project is approved for funding later this year.

The principles of integrative learning were also taken into account in the planning for two professional development workshops for consultants. These will also be tested later this year.

After carefully considering four different learning approaches, one of the major U.S. airlines recently decided to use integrative learning in developing a workshop designed to prepare 1,000 managers to learn new ways of doing business and to integrate these new procedures as a part of their operations management. This project is also underway and will be tested in a few months.

More research is needed regarding the results of applying integrative learning and the four interwoven, interactive components to meet the learning needs of organizations.

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